

Case Report

ANATOMICAL VARIATION OF THE PALMARIS LONGUS MUSCLE: A CASE REPORT

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ABSTRACT

Palmaris longus muscle is one of the common flexor muscles of the forearm. It is one of the most variable muscles and is having immense importance in doing the surgery of the wrist where good orientation is very essential. The variations of this muscle cause compression of the median nerve in the wrist and produce the symptoms of Carpal tunnel syndrome. In routine dissection class of 1st professional MBBS course in NEIGRIHMS, Shillong, in a male cadaver we observed variations of palmaris longus on both the forearm.

Keywords: *Palmaris Longus, Anatomic Variations, Carpal Tunnel Syndrome*

INTRODUCTION

Palmaris longus is a long, slender and fusiform muscle of the forearm and lies medial to flexor carpi radialis. It takes origin from the medial epicondyle of humerus by the common flexor tendon and from adjacent intermuscular septa and deep fascia. It converges on a long tendon, which passes superficial to the flexor retinaculum. A few fibers leave the tendon and interweave with the transverse fibers of the retinaculum but most of the tendon passes distally. As the tendon crosses the retinaculum it broadens out to become a flat sheet which becomes incorporated into the palmar aponeurosis. Palmaris longus is often absent on one or both sides. The muscle is innervated by the median nerve (C7 and C8) which lies partly between the tendons of palmaris longus and flexor carpi radialis at the wrist joint (Standring, 2008). The Palmaris longus muscle undergoes a process of phylogenetic degeneration (William and Straus, 2005). It is a weak flexor of wrist and anchors the skin and fascia of the hand against shearing forces in a distal direction (Sinnatamby, 2011).

CASES

During the routine cadaveric dissection in the practical classes for the medical students of 1st professional MBBS (Batch 2014-2015) of NEIGRIHMS, Shillong, Meghalaya, India, the authors observed the variations of palmaris longus muscle on both the forearm in a 63 years old male cadaver.



Figure 1: Showing the palmaris longus muscle of the right forearm with long tendon proximally and large muscular belly distally (MB = Muscular Belly, T = Tendon)

Case Report

The palmaris longus on the right forearm was originated as a long tendon with a normal origin from the medial epicondyle of humerus and had a large muscle belly which was inserted directly into the superficial aspect of the flexor retinaculum (figure 1).

The palmaris longus on the left forearm had a long tendentious origin from the medial epicondyle of the humerus with a large belly at the middle part of the muscle. The muscular belly was inserted as tendon which was divided into superficial and deep slips. The superficial slip was inserted directly into the superficial aspect of the flexor retinaculum while the deep slip of the tendon of palmaris longus showed a descendant pathway deep to the flexor retinaculum (Figure 2a and 2b).

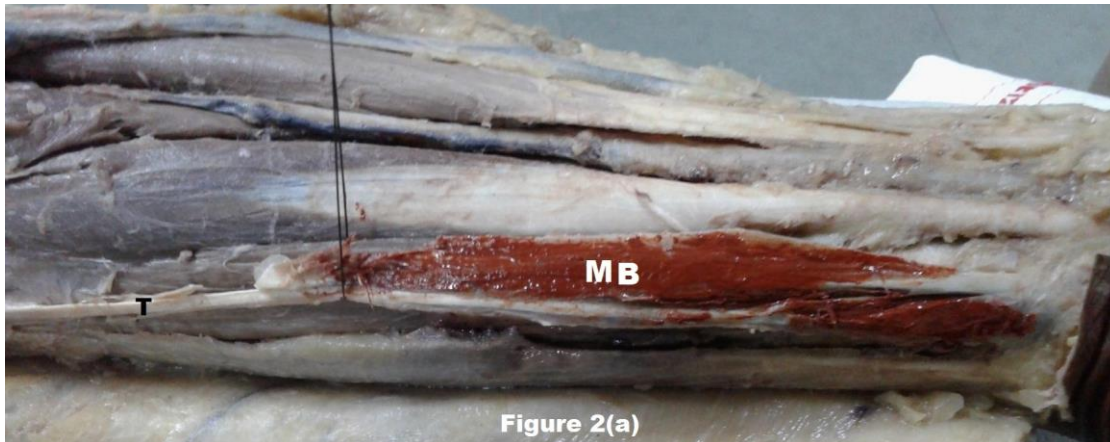


Figure 2(a): Showing the palmaris longus muscle of the left forearm with long tendon proximally and a large muscular belly (MB = Muscular Belly, T = Tendon)

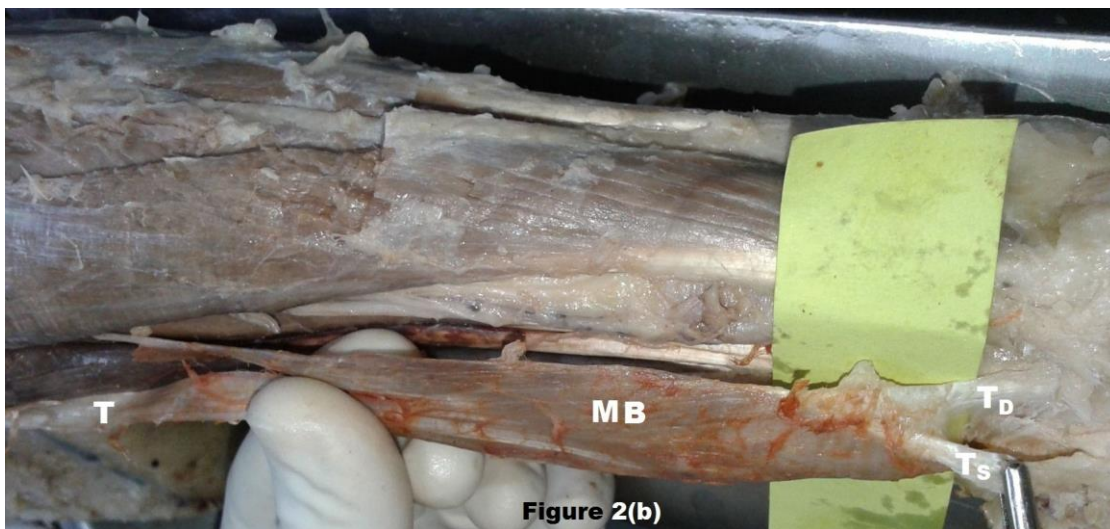


Figure 2(b): Showing the palmaris longus muscle of the left forearm with long tendon proximally and a large muscular belly and superficial and deep slips of tendons distally (MB = Muscular Belly, T = Tendon, T_D = Deep slip of tendon, T_S = Superficial slip of tendon)

DISCUSSION

Palmaris longus is one of the most variable muscles in both number and form (Yildiz *et al.*, 2000) and is phylogenetically classified as a retrogressive muscle; i.e., a muscle with a short belly and a long tendon (Eric *et al.*, 2010; Thompson *et al.*, 2001). Its tendon may be divided into two or three; it may show aberrancy of attachment at its origin or insertion or the muscle may be completely absent (Reimann *et al.*, 1944; Bergman *et al.*,). It was observed that about 11% of bodies palmaris longus was absent and was

Case Report

more common in females and on the left side (Depuydt *et al.*, 1998). Agenesis of the palmaris longus has been attributed to Mendelian characteristics. The absence of the muscle had been described as ranging from a high of about 25% to 16% in white Caucasians (Trohat *et al.*, 1990; Thompson *et al.*, 2001; Webbe *et al.*, 1992) to a low of 4% in mongoloids (Reimann *et al.*, 1944; Sebastin *et al.*, 2006).

The muscle may be digastric or fleshy throughout its entire length. The muscle may have a proximal tendon as well as a distal one. It may be fleshy distally and tendinous proximally. It may be reduced to a mere tendinous band. There may be two palmaris longus muscles. The additional muscle may arise from the medial intermuscular septum, biceps or brachialis, the fascia of the forearm proximally or one of the neighboring muscles, the coronoid process or the radius (Bergman *et al.*, 1984). The muscle may be doubled at its proximal end, with the additional slip arising from one of the sites just mentioned. The insertion of the muscle is also highly variable. It was seen that it was attached to the fascia, the tendon of flexor carpi ulnaris, flexor retinaculum, pisiform bone, scaphoid bone, abductor pollicis brevis, fascia or muscles of the hypothenar eminence, one of the flexor tendons or near the metacarpophalangeal joint (Bergman *et al.*, 1984; Backhouse and Churchill–Davidson, 1975).

Various anomalies of the origin, course and insertion of the palmaris longus muscle have been described by different workers. It was reported that the palmaris longus had a distal belly and was inserted deep to the flexor retinaculum (Backhouse and Churchill–Davidson, 1975). Roberts reported accessory palmaris longus muscle which appeared to compress the ulnar nerve during repeated contractions (Roberts, 1972).

Conclusion

Palmaris longus is considered as an accessory muscle and not essential for normal function of the hand (Eric *et al.*, 2011; Stecco *et al.*, 2009). The belly of palmaris longus muscle situated distally may produce symptoms of median and ulnar nerves compression. However, an asymptomatic muscle may also be of interest in clinical situations because an unexpected muscular belly in the wrist region can cause difficulties in the interpretation of local radiological images.

Palmaris longus tendon is commonly used as a source of graft material by surgeons because it fulfills the necessary requirements of length, diameter and availability and can be used in various reconstructive surgeries. Therefore, every surgeon, radiologist as well as the clinicians must be aware of the variations of palmaris longus muscle.

REFERENCES

- Backhouse KM and Churchill–Davidson D (1975).** Anomalous palmaris longus muscle producing carpal tunnel-like compression. *Hand* 7(1) 22–24.
- Bergman RA, Afifi AK and Miyauchi R (No date).** *Illustrated Encyclopedia of Human Anatomic Variation: Opus I: Muscular System: Palmaris Longus.* Available: http://www.anatomyatlases.org/AnatomicVariants/MuscularSystem/Text/P/03_Palmaris.shtml [accessed November 11, 2012].
- Bergman RA, Thompson SA and Afifi AK (1984).** *Catalog of Human Variation.* Urban & Schwarzenberg, Baltimore.
- Chummy S Sinnatamby (2011).** *Last's Anatomy: Regional and Applied*, 12th edition (Elsevier–Churchill Livingstone) London 66.
- Depuydt KH, Schuurman AH and Kon M (1998).** Reversed Palmaris longus muscle causing effort-related median nerve compression. *Journal of Hand Surgery* 23B(1) 117–119.
- Eric M, Krivokuca D, Savovi S, Leksan I and Vucinic N (2010).** Prevalence of the palmaris longus through clinical evaluation. *Surgical and Radiologic Anatomy* 32(4) 357–361.
- Eric M, Koprivicic I, Vucinic N, Radic R, Krivokuca D, Leksan I and Selthofer R (2011).** Prevalence of the palmaris longus in relation to the hand dominance. *Surgical and Radiologic Anatomy* 33(6) 481–484.
- Reimann AF, Daseler EH, Anson BJ and Beaton LE (1944).** The palmaris longus muscle and tendon: A study of 1600 extremities. *Anatomical Record* 89(4) 495–505.
- Roberts PH (1972).** An anomalous accessory palmaris longus muscle. *Hand* 4(1) 40–41.

Case Report

Standring S (2008). *Gray's Anatomy*, 40th edition, Forearm (Elsevier–Churchill Livingstone) London, U.K. 847.

Stecco C, Lancerotto L, Porzionato A, Macchi V, Tiengo C, Parenti A, Sanudo JR and De Caro R (2009). The palmaris longus muscle and its relations with the antebrachial fascia and the palmar aponeurosis. *Clinical Anatomy* 22(2) 221–229.

Sebastin SJ and Lima Y (2006). Clinical assessment of absence of the palmaris longus and its association with other anatomical anomalies – a Chinese population study. *Annals of the Academy of Medicine, Singapore* 35(4) 249–253.

Thompson NW, Mockford BJ and Cran GW (2001). Absence of the palmaris longus muscle: a population study. *Ulster Medical Journal* 70(1) 22–24.

Troha F, Baibak GJ and Kelleher JC (1990). Frequency of the palmaris longus tendon in North American Caucasians. *Annals of Plastic Surgery* 25(6) 477–478.

William L and Straus Jr (2005). The homologies of the forearm flexors: Urodeles, lizards, mammals. *American Journal of Anatomy* 70 281–316.

Wehbe MA (1992). Tendon graft donor sites. *Journal of Hand Surgery (American Volume)* 17(6) 1130–1132.

Yildiz M, Sener M and Aynaci O (2000). Three-headed reversed palmaris longus muscle: a case report and review of the literature. *Surgical and Radiologic Anatomy* 22(3–4) 217–219.